[FULLY AUTOMATIC AND ENERGY-EFFICIENT DEIONIZER]

Abstract of Disclosure

A fully automatic deionizer comprising five sub-systems for removing ionic contaminants from various liquids at low energy consumption is devised. Based on the charging-discharging principle of capacitors, the deionizer conducts deionization through applying a low DC voltage to its electrodes for adsorbing ions, while more than 30% of the process energy is recovered and stored by discharging the electrodes. At the mean time of discharge, surface of the electrodes is regenerated on site and reset for performing many more cycles of deionization-regeneration till the desirable purification is attained. In one moment, both deionization and regeneration proceed simultaneously on different groups of electrode modules, and in the next moment the electrode modules quickly switch the two processes. Such swift reciprocating actions are engaged in synchronized coordination of sub-systems of electrode modules, energy management, fluid flow, and automatic control.

Figures